PrintDrive Software Component

QuickFix Design Specification
CG-STD-99999

Revision X1
Draft
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Abstract

This specification gives an overview of the workflow of a double burn and flat repair job. It shows how **QuickFix** and **PrintDrive** present a solution to **Computer to Plate** Digital Pre-Press workflow issues. It also describes the requirements for integrating **QuickFix** software component into **PrintDrive**.

Product Manager,   _____ Date _____

Manager, Software Engineering   _____ Date _____

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1. Introduction

The evolution of the printing industry over the past two decades has dramatically changed the procedures and requirements in the industry. Previous to the Computer to Plate (CTP) system, if a plate was damaged or "broke down" on press, someone in the plate department grabbed the film flats and burned a new plate in about 15 minutes. Since CTP eliminates the film flats, an alternative method of quickly re-imaging a plate must be provided.

QuickFix provides functionality which is analogous to tasks in the traditional pre-press workflow. It allows the user to make corrections to the raster data without re-ripping the whole job.

	Traditional Pre-Press	**Digital Pre-Press**
Last-Minute Corrections	Stripper removes a small piece of film which contains the error and replaces it precisely with another piece of film containing the correction	**QuickFix** precisely replaces a region of one-bit raster data with raster data containing a correction. (or re-rip the entire flat)
Merging Copy	double-burn at the plate	**QuickFix** "Double-burn" combines two rasters

This document focus on design issues in integrating existing **QuickFix** software to **PrintDrive** workflow.

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2. Scope

This document targets audiences familiar with the Digital Pre-Press workflow in a PostScript environment, and the current **PrintDrive** and **QuickFix** implementations.

3. Definitions

BaseForm	A double burn original separation
CTP	Computer to Plate
Double Burn	1) To expose the plate with two different films one-at-a-time. 2) To combine rasters in a way analogous to double-burning the plate.
DoubleBurnForm	A separation to be double burned with the BaseForm
DSC	(Document Structuring Convention) DSC comments can be inserted in PostScript to provide instructions to a document manager function. DSC comments are ignored by a RIP.
Engine	Common term for AGFA film imagesetter used in pre-press systems.
Flat	Single image used in the process of burning a plate.
Flat Repair	Replaces a region of one-bit raster data with raster data containing a correction.
Front End Application	Application software used to generate Postscript files, such as Quark.
Input Device Driver	PrintDrive software component that transfers raster data generates by an AGFA developed RIP; such as Taipan; to PrintDrive.
Job	Collection of images defining a small section of a publication.
Job Controller	PrintDrive software component
Job Picker	PrintDrive software component
NT Service	Software that runs independently of user, available to all users of system.
NT™	Formally "Windows NT". Microsoft fault tolerant Windows platform.
OPI	(Open Pre-press Interface) OPI is often used as a generic term for any high-resolution image replacement.
Output Controller	PrintDrive software component

Pipe	A pipe is a communication conduit with two ends; a process with a handle to one end can communicate with a process having a handle to the other end.
Plate	Imaged material used with a single ink in a press for printing.
PowerMux	Code name for AGFA product replacing MultiStar.
PPD	Postscript Printer Definition. Used to configure print devices at front end.
PrintDrive	See PowerMux.
PrintDrive Pilot	PrintDrive software component
QuickFix	QuickFix is a software that allows the user to repair or double burn an already ripped job.
Registry	Place in NT where static information about installed software is held.
RepairForm	Corrected separation
RIP	Raster Image Processor. Converts source data (Postscript) to images.
Separation	Single image or flat representing one color of a color image.
Taipan™	AGFA NT based RIP. Taipan AX, Version 2.0.1 and later is supported.
Tiff Manager	PrintDrive software component
Viper™	AGFA Macintosh based RIP. Version 3.0 and later is supported.

4. References

[1]   *PostScript Environment (PSE) 12.0 Functional Specification*, P. Schellekens & B. Dawe, Rev. E, 7/1/96.

[2]   *PostScript Environment (PSE) 12.0 Product Specification*, P. Schellekens & B. Dawe, Rev. 1.0, 7/1/96.

[3].   *PostScript Printer Description File Format Specification*, Adobe Systems Inc., Rev. 4.3, 2/93.

[4]   *PowerMux 1 Functional Specification*, CG-STD-52O79, B. Boyle, Rev. X3, 7/96.

[5]   *PowerMux 1 User Interface Specification*, CG-STD-52O84.

[6]   *PowerMux Product Specification Addendum*, CG-STD-52O62, J. Lucivero, Rev. 1A, 6/1/96.

[7]   *PowerMux Product Specification*, CG-STD-52O62, J. Lucivero, Rev. A, 1/24/96.

[8]   *PowerMUX Programmers Guide*, CG-STD-?????, J. Catt and C. White.

[9]   *PowerMUX Software Design Specification*, CG-STD-52085, J. Catt and White.

[10]   *Proofing, Merging, & Final Output Functional Specification*, CG-STD-520105, Bruce Brier

[11]   *QuickFix Functional Component Specification*, CG-STD-520107, Bruce Brier

[12]   *QuickFix RN-Alpha-2.2*

[13]   *Taipan 2.0 Functional Specification*, A. Cuypers, Rev. 1st Draft, 4/18/96.

[14]   *Taipan 2.0 Product Specification*, P. Schramme, Rev. Final, 3/27/96.

[15]   *Taipan/PSE/PowerMux Functional Components Specification*, CG-STD-520108, Bruce Brier

[16]   In the Loop, volume 2 No.2, "*Workflow Issues in a Digital Age*", Donna Bloomquist, 1997

5. Existing QuickFix implementation

Currently QuickFix implementation is tightly coupled with the Taipan. Only flat repair is supported.

There are two major pieces of the QuickFix, Geometry-identification and Flat-Repair. Geometry-identification is performed to calculate the area need to be fixed. Flat-Repair is performed to merge the original and RepairForm to create the final copy.

DSCFiltFileServer program performs the Geometry-identification. It looks for an OPI comment ALDImageFileName that has a "*QuickFix.tif*" file name in it, calculates the area that needs to be fixed and stores geometry information in the PostScript file DSC comment Creator. Currently, the comment contains a keyword SingleBurn as a Flat-Repair indicator, number of sets of merging coordinators, starting position, width, height and the width of the whole signature in the Creator. We don't need signature width information for the current implementation.

The user selects either one or four separations to perform Flat-Repair. This is a graphical user interface implementation limitation.

Each time only one application page repair is allowed. If multiple pages must be repaired, the user can either do Flat-Repair multiple passes or re-rip the whole job. Please note that each imposition signature contains several application pages. This is also an implementation limitation.
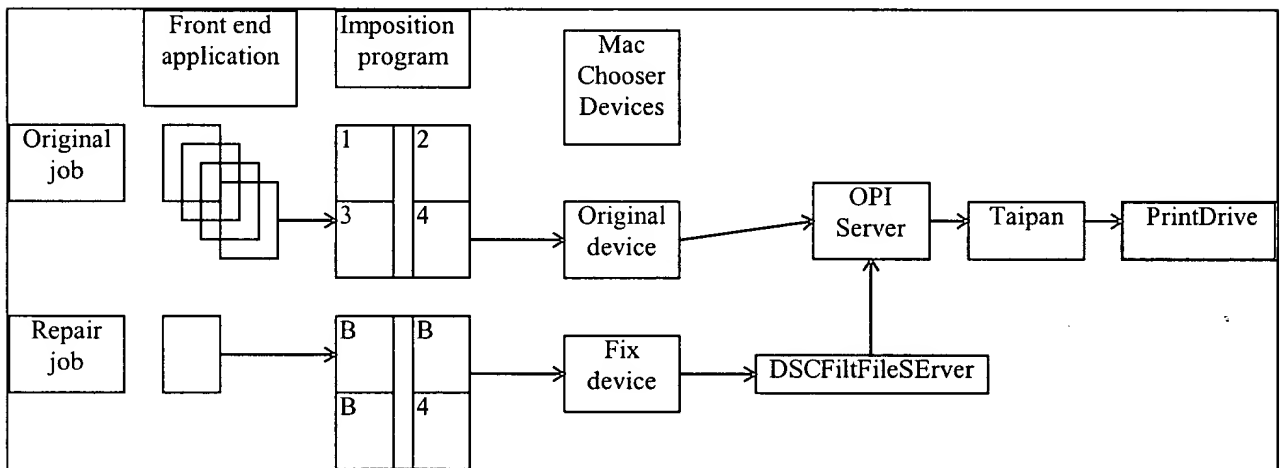
When the user finds an error in a previously Previewed job, Proofing job or already imaged job, the user has to go back to the front end application to fix the problem. The user must first create a RepairForm by correcting the error and inserting a Tiff file "*QuickFix.tif*" in the area that needs to be repaired. If the whole page needs to be repaired, the user does not need to insert a "*QuickFix.tif*" file. Then the user brings up the

Imposition program to create a repair job using the same imposition template. With this program, the user inserts a **RepairForm** to the page to be updated and blank pages to where changes are not needed.

When the user finishes creating a repair signature, the new job is sent to the output device that is created as part of the **QuickFix** installation. The output device is actually a pipe that takes the input from the Imposition program and sends it to the **DSCFiltFileServer**. Currently, the **DSCFiltFileServer** is invoked when the user is ready to send a job.

After **DSCFiltFileServer** finishes processing the input, it saves the output in a designated folder for further processing. If OPI image replacement is required, the user needs to configure the OPI server to pick up input from the designated folder automatically and pipe output to **Taipan**. If not, **Taipan** will process jobs in the designated folder if the user sets the designated folder as the **Taipan** Hot folder.
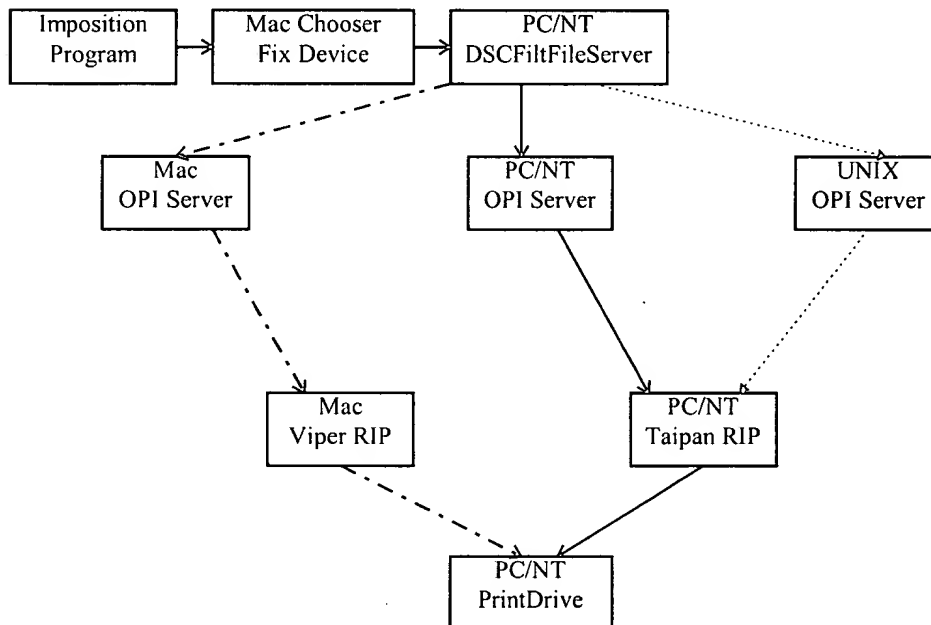
Taipan generates raster data and stores them in **Tiff** file format. The user needs to invoke the **qfdia.exe** application to perform **Flat-Repair**. The qfdia.exe is also invoked by the user. From the user interface, the user selects an original job and a repaired job pair to perform the merge.

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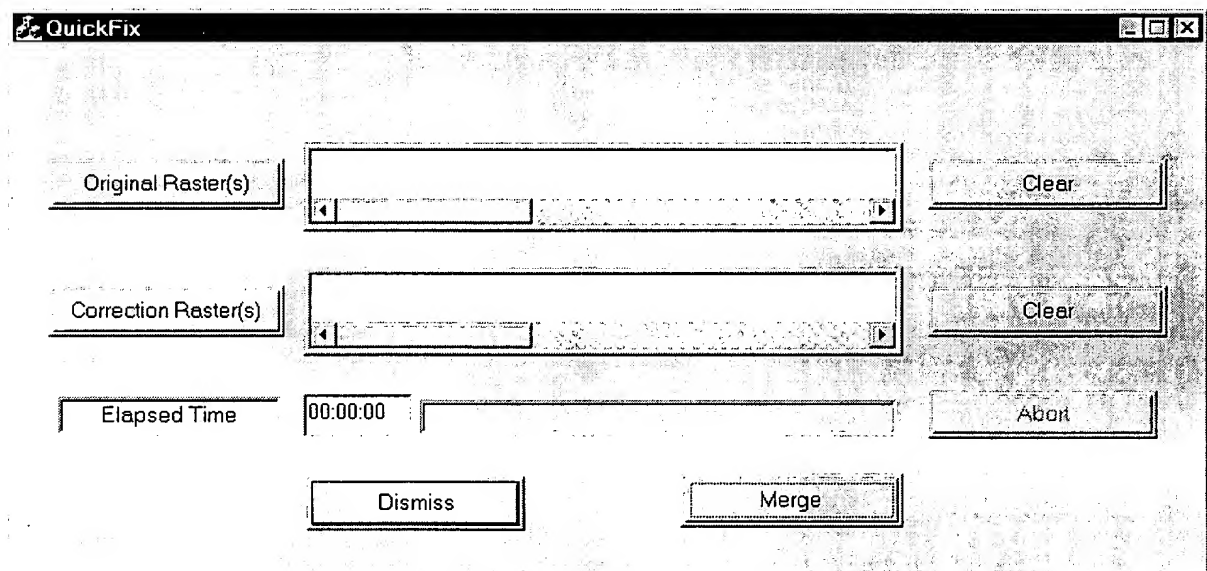
6. Requirement

PrintDrive supports a RIP on different platforms such as PC/NT **Taipan** and Macintosh **Viper**. The platform affects how **DSCFiltFileServer** is invoked.

PrintDrive must support OPI servers and RIPs on different platform. How to configure a OPI server to pick up jobs in a designated **DSCFiltFileServer** folder and redirect jobs to a RIP after it finishes replacing low resolution image files with high resolution image files needs to be worked out.

```
┌────────────┐    ┌────────────┐    ┌────────────────┐
│ Imposition │───▶│ Mac Chooser│───▶│    PC/NT       │
│  Program   │    │ Fix Device │    │ DSCFiltFileServer│
└────────────┘    └────────────┘    └────────────────┘

   ┌──────────┐        ┌──────────┐        ┌──────────┐
   │   Mac    │        │  PC/NT   │        │  UNIX    │
   │OPI Server│        │OPI Server│        │OPI Server│
   └──────────┘        └──────────┘        └──────────┘

        ┌──────────┐              ┌──────────┐
        │   Mac    │              │  PC/NT   │
        │ Viper RIP│              │ Taipan RIP│
        └──────────┘              └──────────┘

                   ┌──────────┐
                   │  PC/NT   │
                   │ PrintDrive│
                   └──────────┘
```

There are two types of repairs - **DoubleBurn** and **Flat Repair**. **PrintDrive** supports both types. **Versioning** is one type of the **DoubleBurn**.

Job List shows job merging status. **Job Logger** contains information about each merged job. The user is allowed to review job history, which jobs are merged, which page/separation is to be double burned with which, which separation is to be repaired with which.

The user is allowed to repair any job. This includes the original of a **DoubleBurn** job.

The user is allowed to repair or double burn multiple application pages at the same time.

No automation is supported. The user is required to provide input to merge jobs. The user can select any number of jobs or separations to merge.

The user is allowed to **Proof** or **Preview** a repaired job.

7. Design Overview

DSCFiltFileServer is a PC/NT executable installed as an NT server. Access DSCFiltFileServer through the Macintosh Chooser device. Client passes Postscript filename information to server. Server write files in designated folder created at installation time.

The DSCFiltFileServer writes an ImageWhen **hold** condition to files. A job contains either RepairForm or DoubleBurnForm coming into the PrintDrive is not ready to be outputted.

A double burn original contains the BaseForm and DoubleBurnForm. The DoubleBurnForm can be in a separate job. A repair job RepairForm always in a separate job. The user inserts either "*QuickFix.tif*" or "*DoubleBurn.tif*" in the application pages to tell DSCFiltFileServer what is in the file. The server calculates and writes the geometry information in the DSC Creator comment.

The server writes a keyword DoubleBurn in the Creator comment if it finds a "*DoubleBurn.tif*" file in an OPI ALDImageFileName comment. Otherwise, the server writes a keyword SingleBurn in the Creator comment. It also writes multiple pages repair or double burn coordinator information in the Creator comment.

Assuming the user is allowed to repair or double burn a whole page or just small area(s), the user must insert a "*QuickFix.tif*" or "*DoubleBurn.tif*" file enclosing a whole page or small area(s) to an application page.

An AGFA based RIP passes information stores in the Creator comment to Input device driver. Input device driver saves geometry information in the Tiff header via Tiff Manager, and saves ImageWhen **hold** condition in the job parameter via Job Control Client.

The user selects jobs from the Job List to merge them together. Merging job together put all separations from selected jobs into one job. The user has to decide which job is the one. Each separation merged into this one job contains default job parameters information, such as whether it is a RepairForm or DoubleBurnForm, the original document and page names.

A new Merge function is added to the Job Controller/Job List. The user can either click the Merge icon from the Job List main dialog or right mouse click to bring up menu.

The user selects a job to Group after the RepairForm and/or DoubleBurnForm are merged with the original job. Grouping job includes moving RepairForm or DoubleBurnForm to the correct page and linking them with the original separation within a job.

A new **Job Property** tab **Group** is added to **Job Property** dialog. Two lists side by side shows the job document tree. The first list shows the document tree of the job at page level. The second list shows the document tree at the separation level. The user selects a page from the first list and a page from the second list to select a separation or group of separations to move to the selected page in the first list. The user moves separations by drag and drop or clicking the **Move** button.

After the user finishes moving separations into the correct pages, the user then selects multiple separations from the second list in the same page to **Group**. Grouping separations is simply writing a hint to allow the **Output Controller** to repair and/or double burn flats when outputs to the engine.

The user must enter a separation name to group or ungroup a set of separations. This separation is a page contains only links to separations of the same group. After the user finishes grouping separations, the second list lists the new separation name in stead of a group of the separations. The user selects the new separation brings up a list of separations of the same group.

Flat repair or double burn happens when a job is outputting to the engine. The user can still **Proof** or **Preview** a flat repair or double burn job. But no MergeForm is created and stored in the disk. The **Output Controller** utilizes same methods Proofer and Previewer use to Oring or Anding raster data before it sends them to the engine. Jerry Catt has all the answers.

We should consider the pros and cons of not creating a MergeForm. What is the time and disk space saving?? What if a job has a **BaseForm** needs to be repaired and contains multiple versions of **DoubleBurnForm** to be merged at output time??

8. Software Components

DSCFiltFileServer and different components of the PrintDrive must change to accommodate the QuickFix workflow.

8.1 Installation

The only major component is the DSCFiltFileServer.

Geometry Identification by DSCFiltFileServer must be installed where the RIP is installed. This is a separate installation procedure from the PrintDrive installation. Installation procedures include prompting the user to:

◊ select an area to put DSCFiltFileServer stuff,

◊ create an output device via NT Add Printer utility (see reference 12) or ??? to create a Macintosh Chooser device,

◊ configure the OPI server to pick up output from the DSCFiltFileServer and redirect to a RIP after it finishes image replacement,

◊ allow the DSCFiltFileServer to start up as a NT service or ??? on Mac.

8.2 DSCFiltFileServer

The DSCFiltFileServer component must be modify to support a client/server architecture. The server is installed and starts automatically. The DSCFiltFileServer client passes a job to the server upon user request.

The ALDImageFileName OPI comment interface is as followed:

```
%%ALDImageFileName
DocumentCreator::MergeKeyword:NumberOfCoordinators:StartingX:StartingY:
AreaWidth:AreaHeight

MergeKeyword is either SingleBurn or DoubleBurn.

NumberOfCoordinators is an unsigned integer.

StartingX, StartingY, AreaWidth and AreaHeight are in points.
```

The user inserts a "*DoubleBurn.tif*" file to an application page for a DoubleBurnForm. The DSCFiltFileServer puts a keyword DoubleBurn in the DSC Creator comment.

The user inserts a "*QuickFix.tif*" file to an application page for a RepairForm. The DSCFiltFileServer puts a keyword SingleBurn in the DSC Creator comment.

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The **DSCFiltFileServer** also puts an ImageWhen **Hold** condition to every job passing through the server.

8.3 Merge

Merge is a new function. The user selects this function by selecting a list of jobs to merge from the Job List first, then selects the Merge icon from the Job List dialog or right mouse click to bring up menu.

Creates a new dialog for this function. It has a list box lists all the selected jobs to merge. The user is required to select a job as the primary job. After merge, this primary job contains all the pages and separations from the other selected jobs as well as its own.

Defines new job parameters to store original job document and page name. **Merge** function interface with Job Control Client to move separations and write their origin information into job parameters.
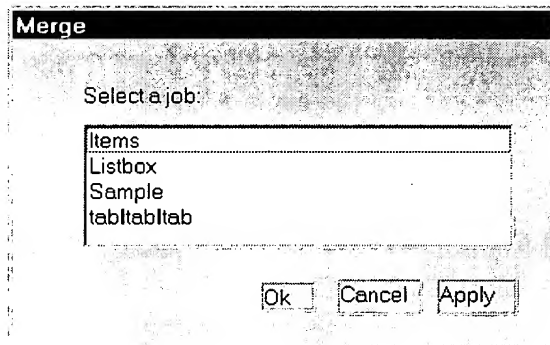
For example, Job1 is a double burn original job. It contains 2 versions of K separations in Page 1 and one version of M separation in Page 2.
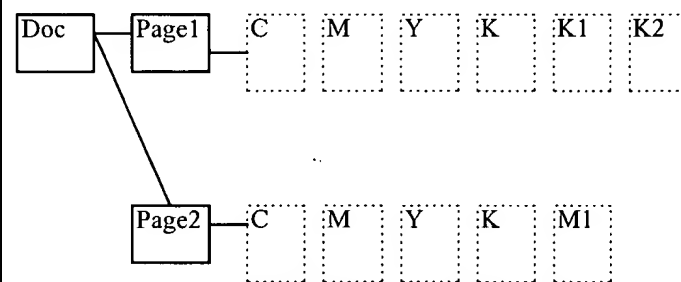
The user finds a problem in Page 1 Y and K separations and Page 2 M separation.

Job2 contains **RepairForm** for Job 1.

| Doc | Page1 | Pg1 Y | Pg1 K | Pg2 M |
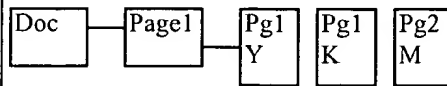
Job3 contains **DoubleBurnForm** for Job 1.

| Doc | Page1 | Pg1 K3 | Pg2 Y1 |
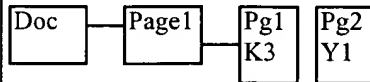
The user can select job1 and job2; or job1 and job3; or job1, job2 and job3 to merge.

Assuming the user selects job1 as the original and selects all three to merge. The pages and separations of the job2 and job3 are now merged into job1. Each separation from job2 and job3 has job parameters contains information about its original document name and page name.

| Doc | Page1 | C | M | Y | K | K1 | K2 |

| Pg1 Y | Pg1 K | Pg2 M |

| Pg1 K3 | Pg2 Y1 |

| Page2 | C | M | Y | K | M1 |
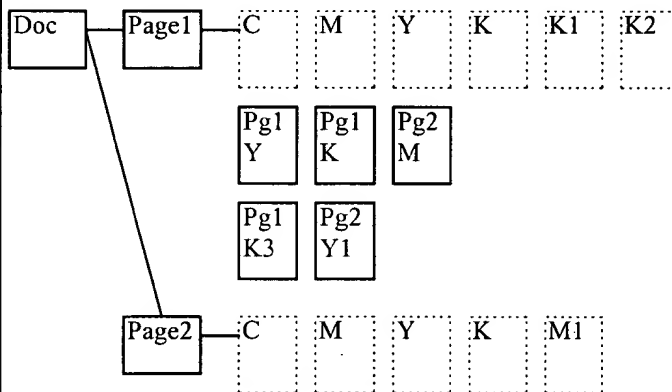
8.4 Grouping

Grouping is a new function. The user selects this function by selecting a job, bringing up the job property dialog, and then selecting the **Group** tab.

Creates a new dialog for **Grouping**. This dialog box contains two lists. Each list is the document tree of the same job. The first list shows a lists of pages in this job. The second list also shows lists of pages of the same job. The user must select a page from the second list to bring up list of separations.

The user must move the separations into the correct page first. The user can either drag and drop or use the Move button to move separations. Moving separations means reconstruct the job information. Job Control Client is involved to facilitate the move.

Doc	Page1	C	M	Y	K	K1	K2

| | | Pg1 Y | Pg1 K | | | | |

| | | Pg1 K3 | | | | | |

| | Page2 | C | M | Y | K | M1 | |

| | | Pg2 M | Pg2 Y1 | | | | |
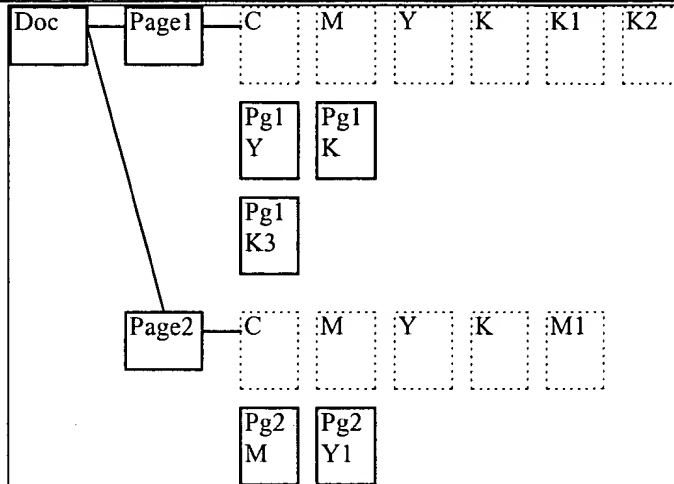
The user groups separations into a new separation. This new separation is a file that contains links to an original separation, **RepairForm**(s), and/or **DoubleBurnForm**(s) if any. After grouping is complete, the new separation is listed in the document tree. The user selects the new separation brings up a lists of separations links to this one. All the separations in the same group is marked non-imageable. This is a new job parameter. Separations marked non-imageable will not be outputted to the engine.

Page1	C	M	Y	K	K1	K2	Pg1 Y	Pg1 K3	Pg1 K

New Y

New K1

New K2

New K3

Page2	C	M	Y	K	M1	Pg2 M	Pg2 Y1

New M1

New Y1

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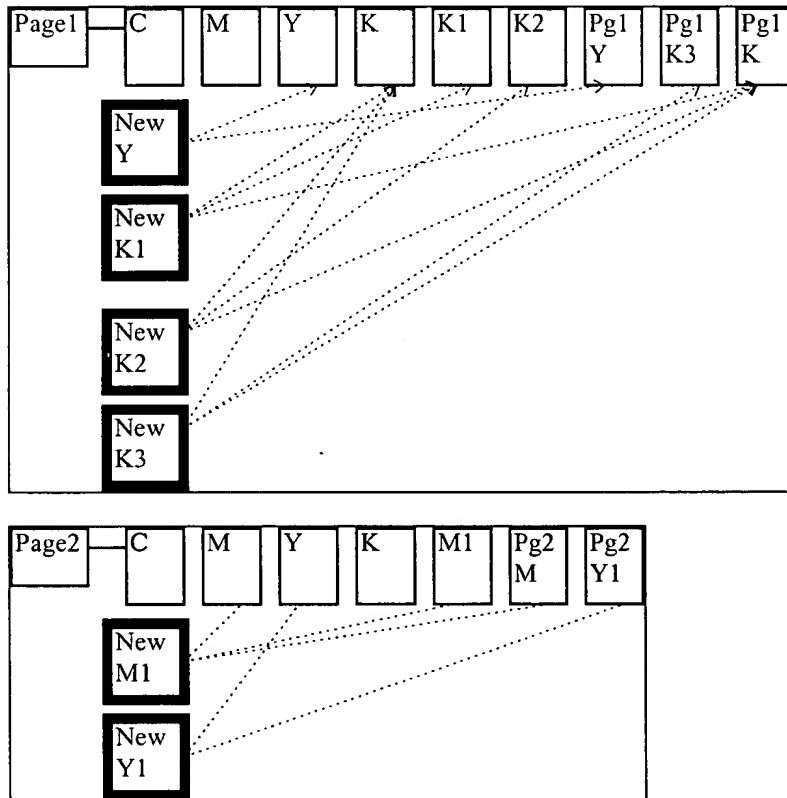
The user selects a new separation to ungroup. This puts all the separations of the same group to the same page they were in before the grouping takes place. Each separation is marked imageable. The new separation is removed from the document tree.

```
┌─────────────────────────────────────────────────────────────┐
│ Group                                                         │
│                                                               │
│  ┌─────────────────┐              ┌─────────────────┐         │
│  │ Expanded Node    │              │ Expanded Node    │        │
│  │   Expanded Node  │              │   Expanded Node  │        │
│  │     Leaf         │              │     Leaf         │        │
│  │     Leaf         │              │     Leaf         │        │
│  │   Collapsed Node │              │   Collapsed Node │        │
│  │ Leaf             │              │ Leaf             │        │
│  │                  │  ┌────────┐  │                  │        │
│  │                  │  │<< Move │  │                  │        │
│  │                  │  ├────────┤  │                  │        │
│  │                  │  │Move >> │  │                  │        │
│  └─────────────────┘  └────────┘  └─────────────────┘         │
│  ┌─ Group ──────────────────────────────────┐                 │
│  │ Separation Name: [              ]         │                 │
│  │  [Group]  [Ungroup]                       │                 │
│  └───────────────────────────────────────────┘                │
│                      [OK]  [Cancel]  [Apply]                   │
└─────────────────────────────────────────────────────────────┘
```
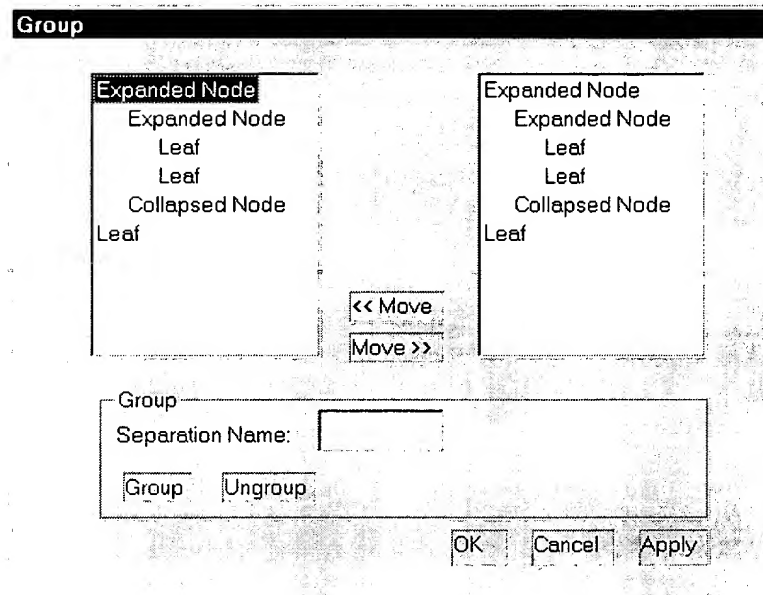
Removing the ImageWhen hold condition after the user finish grouping the job allows the Job Picker to check output criteria. If all condition meet, the Output Controller will merge raster data and send to engine.

From the example above the following separations will be sent directly or created first and then sent to engine by the Output Controller:

Page1: C, M, New Y, New K1, New K2, New K3
Page2: C, New M1, New Y1, K

Page1 New Y is a group of a repair and an original flats. The Output Controller repairs Y separation in the area specify in the repair flat Tiff header, then sends to the engine directly.

Page1 New K1 is a group of an original flat, a repair flat and a **DoubleBurnForm**. The Output Controller Oring the original K flat and **DoubleBurnForm** according to the area specify in the **DoubleBurnForm** Tiff header, repairs the area specify in the repair flat Tiff header, and sends to the engine directly.

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8.5 Support

Input Device Driver	Allows geometry information stores in the DSC comment **Creator** passing through the RIP and saved in Tiff header via the **Tiff Client**.

Job Control	New **PrintDrive Merge** and **Grouping** functions interface with the **Job Control Client** to:
	
	   o merge jobs,
	
	   o save job document and page name into job parameters,
	
	   o delete jobs,
	
	   o move separations within a job,
	
	   o set job Input and Merge status,
	
	   o create a new separation that contains links to other separations,
	
	   o delete separations,
	
	   o update job information.

Job Logger	**QuickFix** software interfaces with the **Job Logger client** to log job merging status.
Existing raster data manipulation member functions	Jerry knows the secret place for this class. This class is currently used by the Proofer and Previewer. This class must be modified in order for the Output Controller to make use of it.
Output Controller	**Output Controller** interfaces with existing data member functions to Or or And separations before it sends data to an engine.

9. User Interface Design

Areas of changes are in the **PrintDrive Pilot/Job List**.

9.1 Job List Main Dialog

We need to create and add an icon for the **Merge** function in the **PrintDrive Job List** dialog, and add a **Merge Status** to the **Job List** main dialog. Adds **Merge** function into pop up menu.

Adding a **Merge Status** field to the **PrintDrive Job List/Document Properties** dialog, allows the user to checks off **Merge Status** box to enable the **Merge Status** in the **Job List** main dialog. When merging jobs, the primary selected job **Merge Status** display the merging status accordingly.

PrintDrive Job List - mickey

View Device Job Help

ID	Name	Device	Media	Input St...	Output St...	Priority	Image When	User	Created	Proo
1	Victoria	TestEngine		⚠		Normal	Hold	lu	07/23/97 10:59:35	
2	Bushkill	TestEngine	12"4milFilm	⚠		Normal		lu	07/23/97 11:01:59	
3	Pennine	TestEngine	12"4milFilm	⚠		Normal	Hold	lu	07/23/97 11:02:34	

Ready

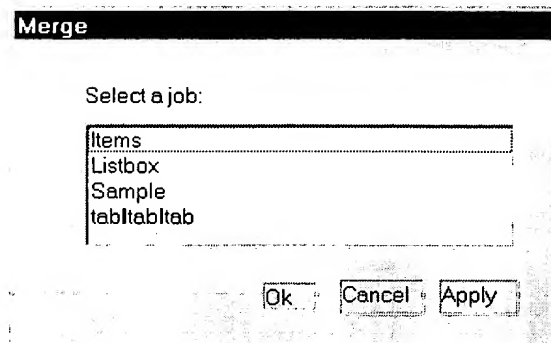
Document Properties

Columns

1. Check properties required for display
2. Drag and drop to create display order

- ☑ ID
- ☑ Name
- ☑ Device
- ☑ Media
- ☑ Input Status
- ☑ Output Status
- ☑ Priority
- ☑ Image When
- ☑ User
- ☑ Created
- ☑ Proof Status
- ☑ Backup Status

[OK]   [Cancel]   [Apply]

9.2 Job List/Merge

The Merge dialog has a list box allows the user to select a job as the primary job.

```
┌──────────────────────────────────────────┐
│ Merge                                      │
│                                            │
│   Select a job:                            │
│   ┌─────────────────────────────────────┐ │
│   │Items                                 │ │
│   │Listbox                               │ │
│   │Sample                                │ │
│   │tabltabltab                           │ │
│   │                                      │ │
│   └─────────────────────────────────────┘ │
│                                            │
│             [Ok  ] [Cancel] [Apply]        │
│                                            │
└──────────────────────────────────────────┘
```

9.3 Job List/Job Properties/Group

Add a new **Group** tab to the **Job Properties** dialog.